



Missouri  
Department of  
Natural Resources



# Kansas City 8-Hour Ozone Maintenance Plan

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November 14, 2006

# Overview

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- Ground level ozone
- KC Region ozone history
- Form of standard
- Future steps
- Contingency measures

# Ground Level Ozone

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- Identical to upper atmosphere ozone
- Caused by chemical reaction of volatile organic compounds (VOCs) and NO<sub>x</sub>
- Concentrations higher when conditions are hot, sunny with light winds
- VOCs and NO<sub>x</sub> from cars, trucks, small businesses, utilities & large industry
- Can trigger breathing problems, particularly in those with respiratory conditions

# KC Region Ozone History

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- From mid-1970s through early 1990s, KC exceeded 1-hour ozone standard
- In 1992, area was redesignated attainment for 1-hour ozone standard
- KC violated 1-hour ozone standard in mid-1990s
- KC has met the 1-hour standard in 2000s
- EPA issued 8-hour standard in 1997--- 084 ppm (84 ppb)
- KC designated attainment for 8-hour standard in May, 2005

# 8-Hour Ozone Standard Determination

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- Design Value for a Metropolitan Statistical Area is the highest value from any site
- Three year average of the fourth highest daily maximum
- Violation occurs if three-year average exceeds 84 ppb
- Kansas City would have violated standard in mid-80s, 90s, 2000 & 2002

# Variables in the KC Ozone Equation

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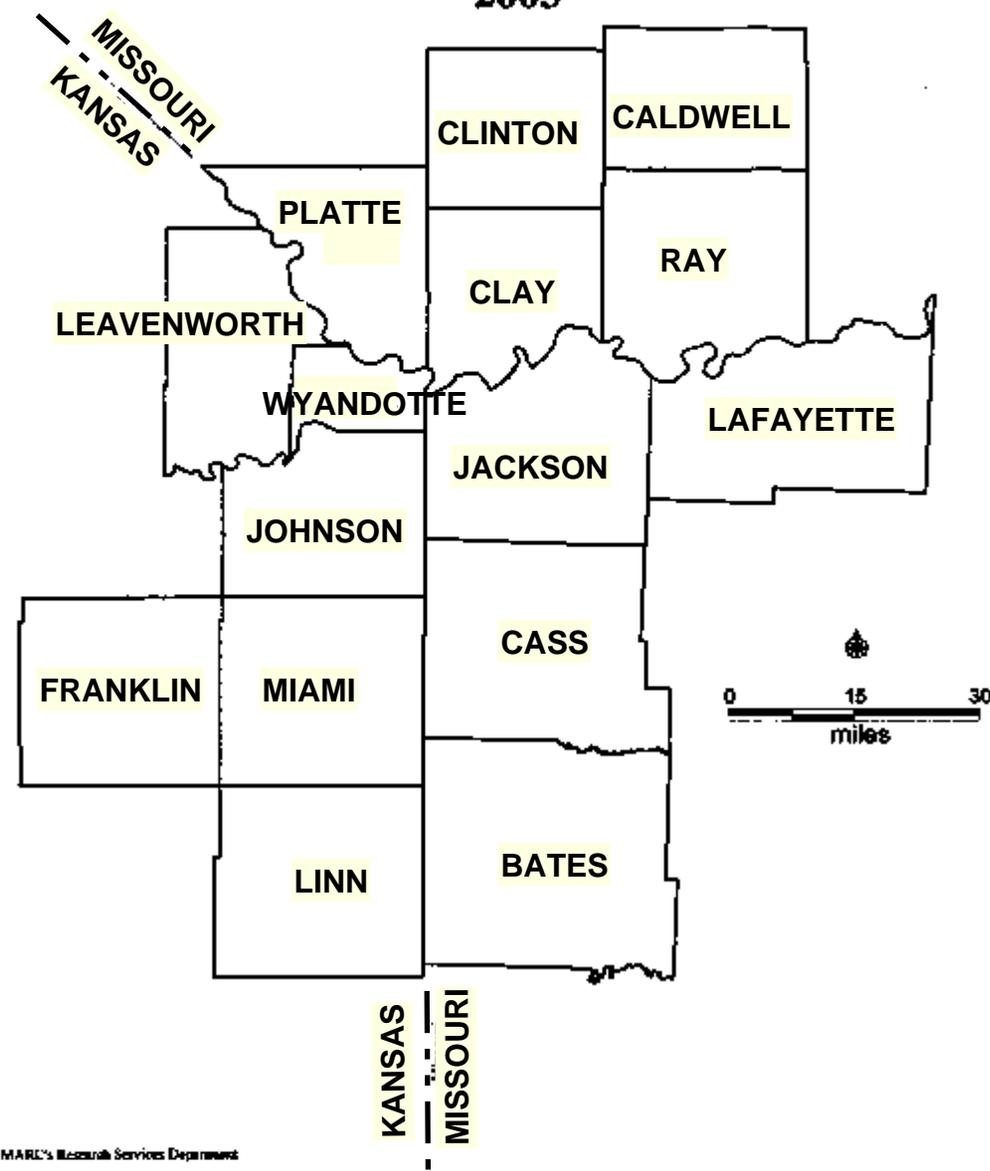
- Weather
- Emission Reductions/Increases
  - Clean Air Interstate Rule
  - Tier 2 Vehicle and fuels rule
  - Heavy Duty Diesel rule
  - Regional Haze rule
  - Voluntary programs
  - Flint Hills burning emissions

# Consequences of Nonattainment Designation

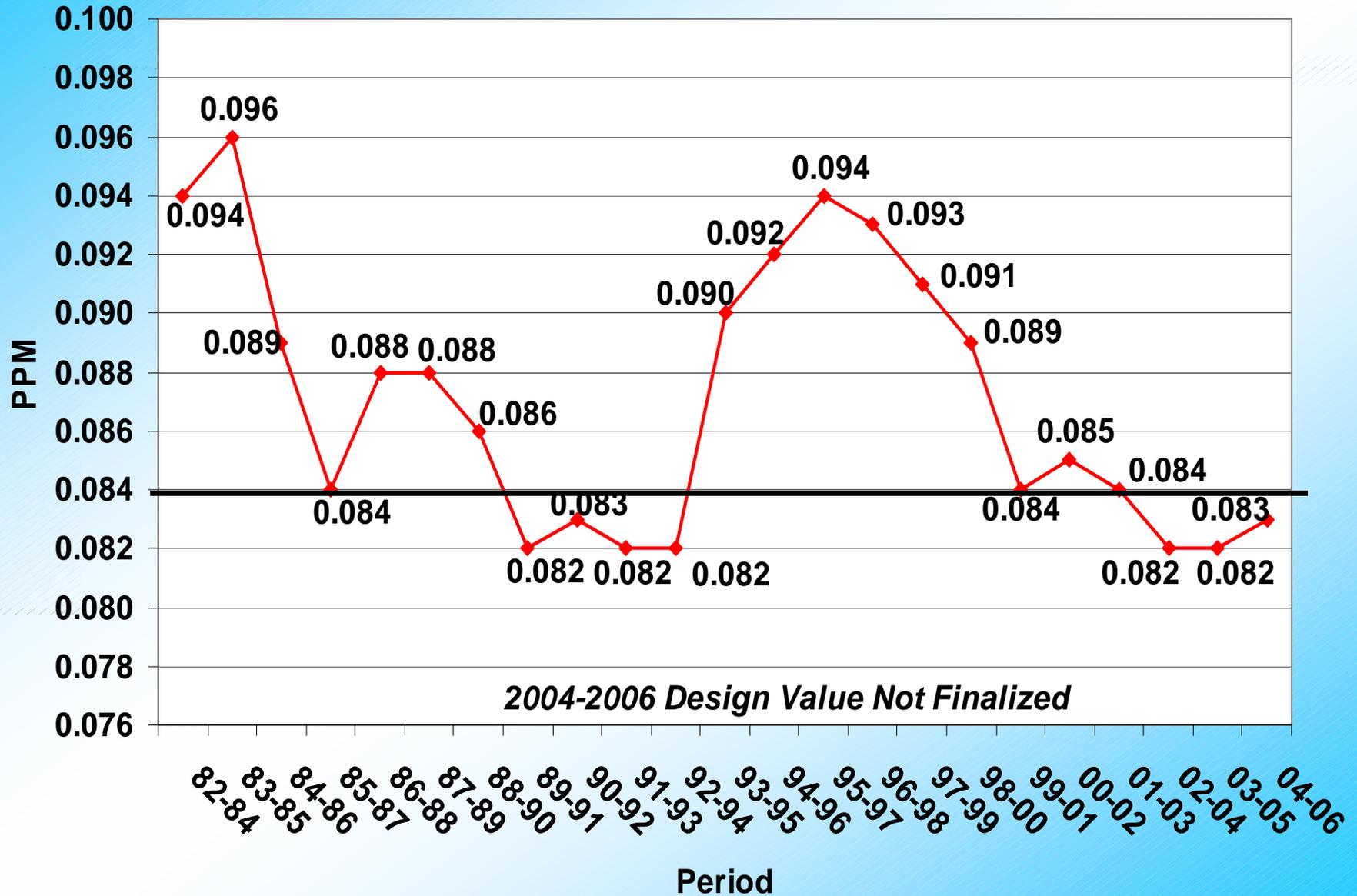
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- RACT rules
- LAER review for NSR permits
- Transportation plan conformity with SIP
- Curtails economic development
- State Implementation Plan revision
- Additional inventory and modeling work
- Potential sanctions for failure to meet standard
- **Citizens breathing polluted air**

# Kansas City Metropolitan Statistical Area 2003



# 8-Hour Ozone Design Values Kansas City



# Are We Critical Yet?

## 8-Hour Ozone Monitoring Data for Kansas City

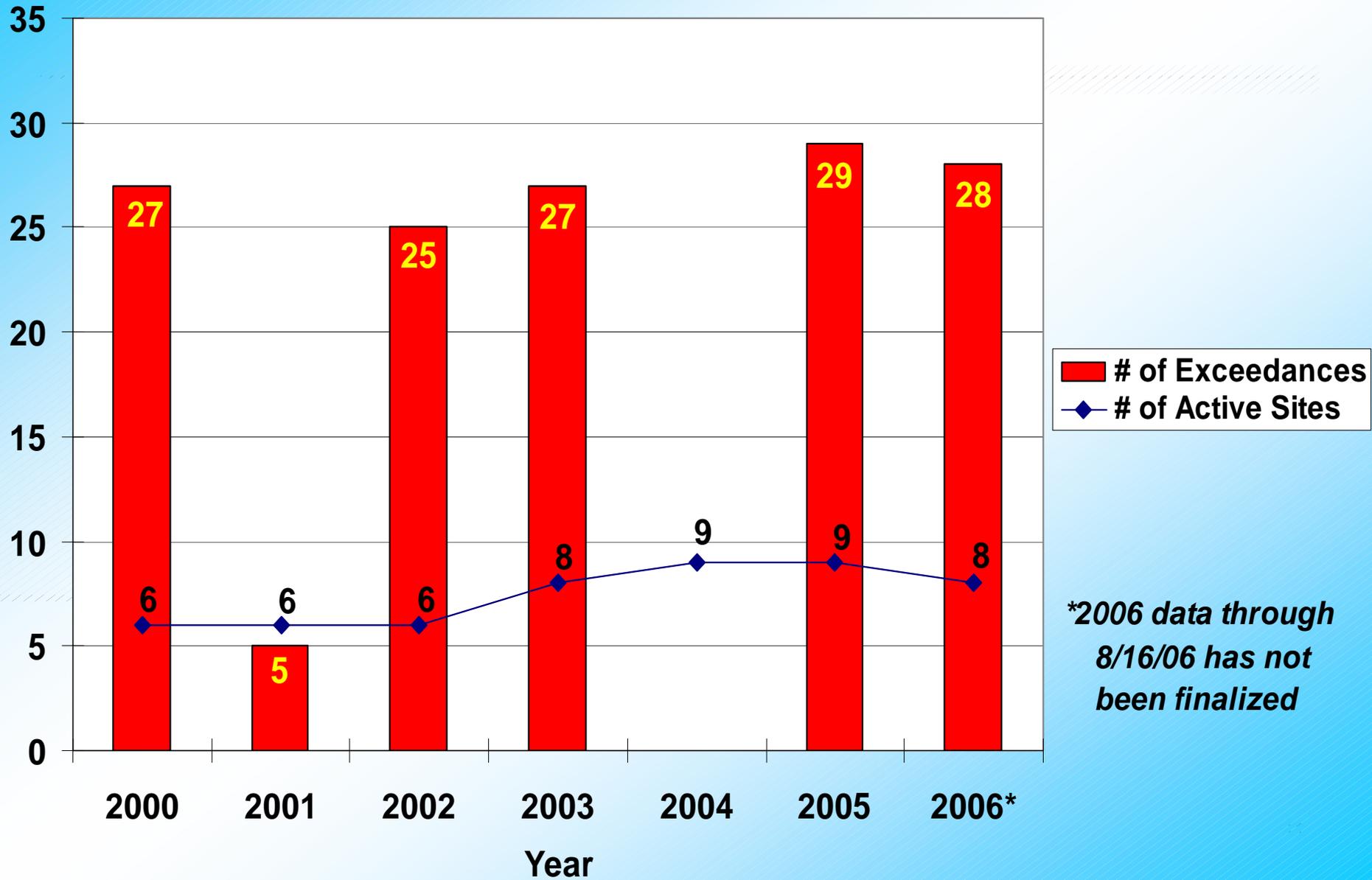
Site	4th High (ppm)			Design Value	Critical Value
	2004	2005	2006*	04-06*	2007**
JFK	0.063	0.079	0.081	0.074	0.094
Heritage Park	0.066	0.081	0.076	0.074	0.097
Leavenworth	0.067	0.077	0.073	0.072	0.104
Liberty	0.071	0.088	0.092	0.083	0.074
Rocky Creek	0.069	0.087	0.087	0.081	0.080
Richards Gebauer-South	0.061	0.081	0.078	0.073	0.095
Trimble	0.071	0.087	0.083	0.080	0.084
Watkins Mill	0.067	0.079	0.091	0.079	0.084

**\*2006 data are current through 8/15/06 and have not gone through final QA/QC**

**\*\*4th high must be equal to or lower than this value for the three-year average (design value)  $\leq$  0.084 ppm.**

# Kansas City

## 8-Hour Ozone Exceedances



# Emissions Source Categories

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- **Point:** Permitted sources of pollutant emissions.
- **Area:** Sources below the permit cutoffs: dry cleaners, auto body painting, house painting and solvent use.
- **Mobile On-road and Off-road:** autos, trucks, planes, trains, construction, farm equipment & lawn and garden equip.

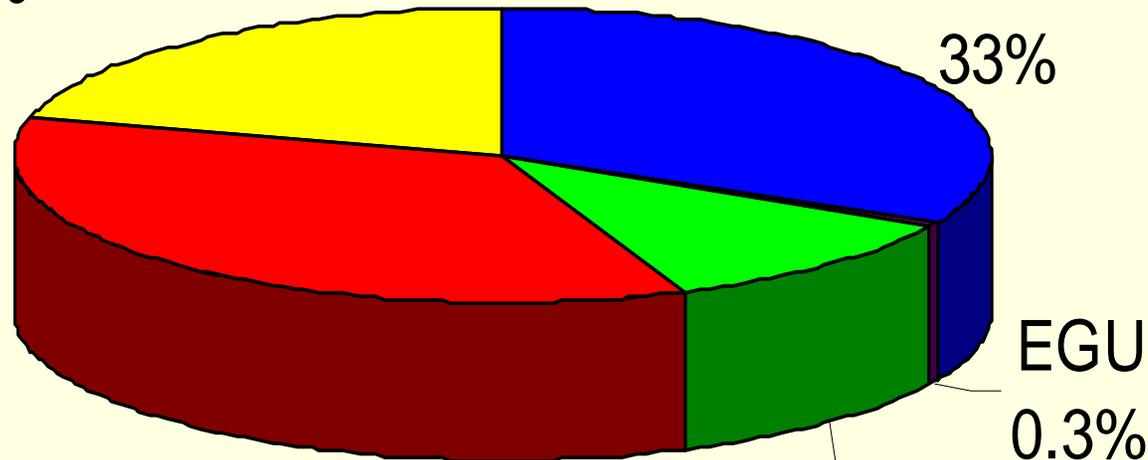
# 2002 Typical Ozone Season Day VOC Emissions

Non-road Mobile

21%

Area

33%



EGU

0.3%

Mobile

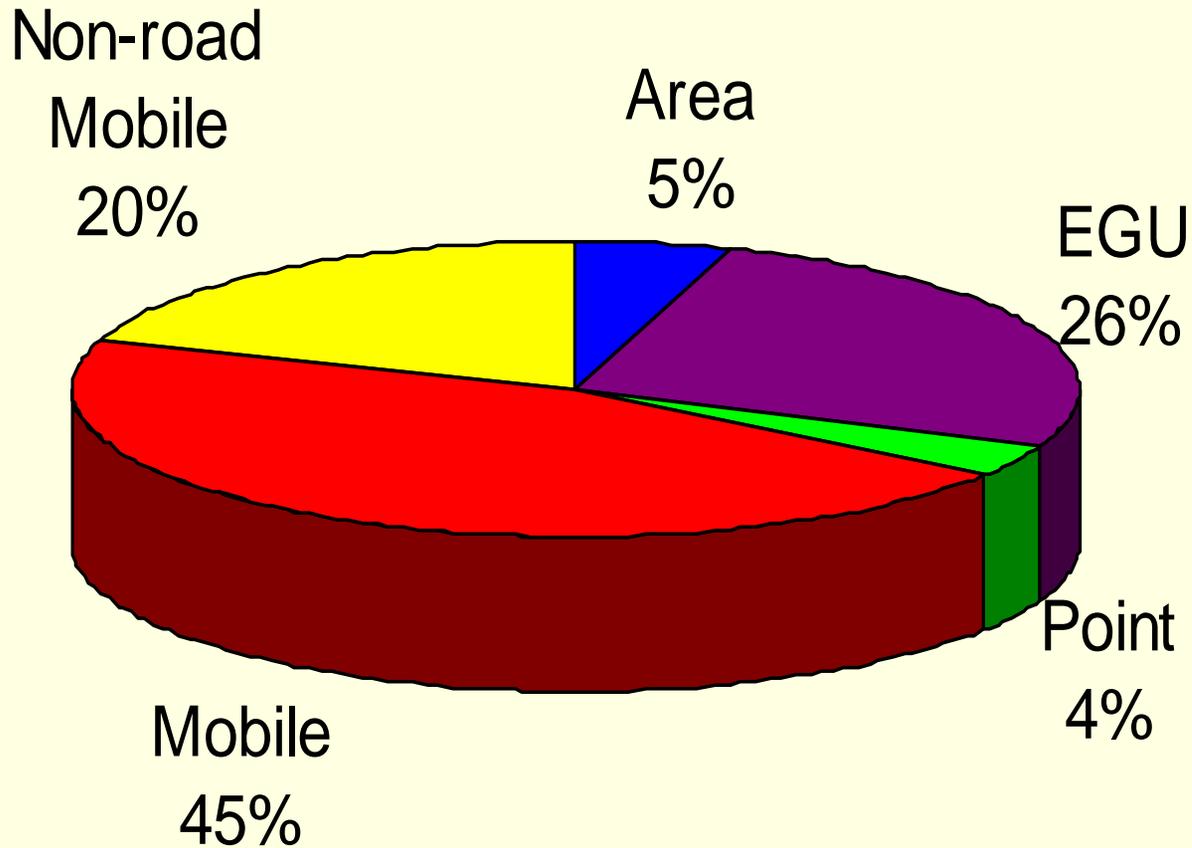
35%

Point

11%

227.71 tons/day

# 2002 Typical Ozone Season Day NOx Emissions



319.89 tons/day

# Clean Air Action Plan

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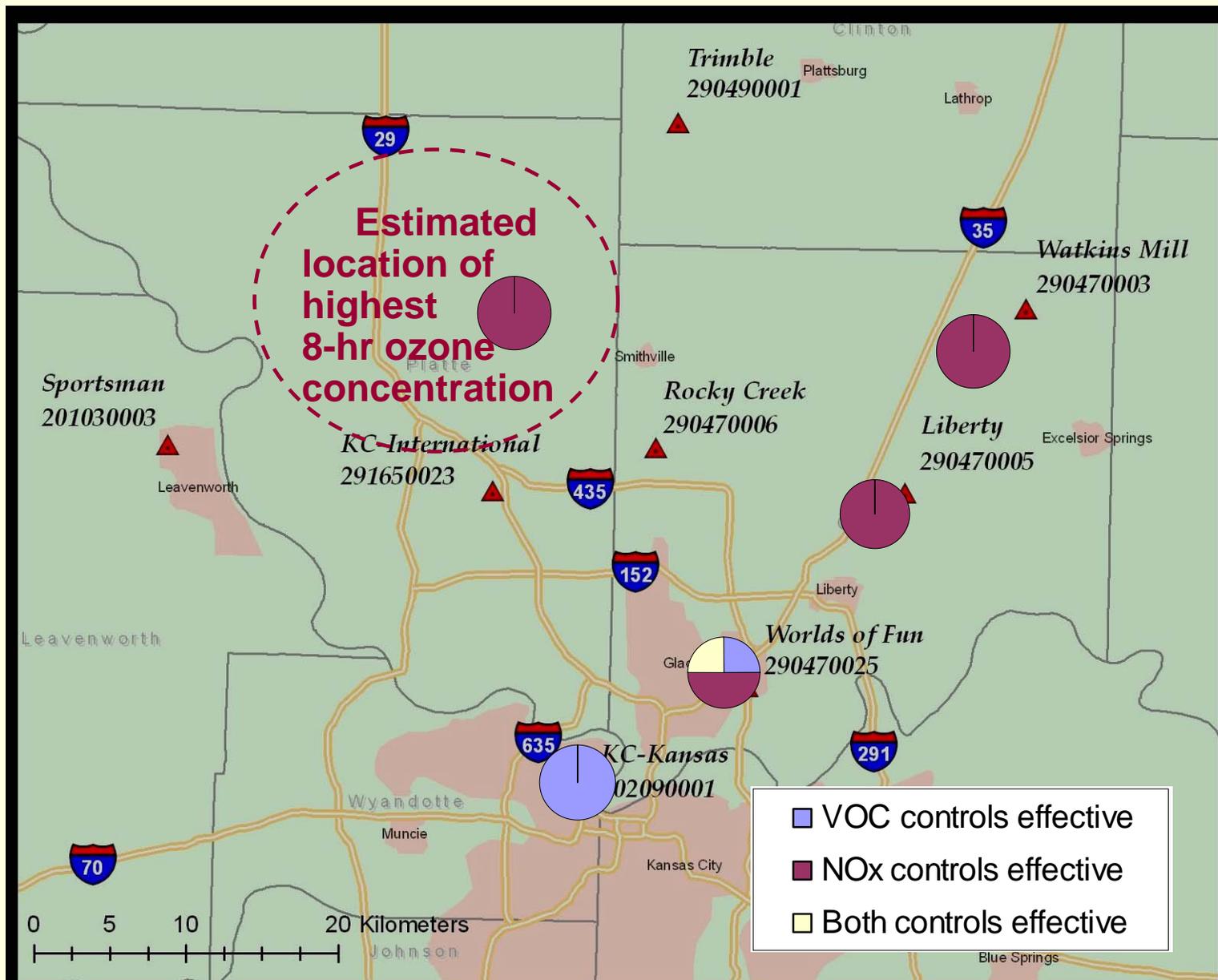
- Coordinated by MARC
- Developed in 2004
- Comprehensive voluntary plan for reducing emissions
- Targets both stationary and mobile sources
- Contains short, intermediate and long term emission reduction measures

# Current Area and Mobile Source Activities

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- Low RVP gasoline
- Gasoline tank truck vapor testing
- Ozone alerts
- Bus RideShare
- AirQ workplace initiative
- Gas cap testing programs
- Employee carpool incentive programs
- Solvent metal cleaning rule
- Technical Seminars
  - Lawn and Garden
  - Printing
  - Painting
  - Solvent metal cleaning

# Effectiveness of VOC and NO<sub>x</sub> Controls



# Future Activities

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- Episode of photochemical modeling
- Continued implementation of voluntary strategies
- 8-hour maintenance plan submission
  - Due to EPA on June 15, 2007
  - Public Hearing process in Missouri will begin in March 2007

# Maintenance Plan Contingency Measures

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- Primary focus on NO<sub>x</sub> reductions
- Phased approach
  - First trigger at 85 ppb
  - Large NO<sub>x</sub> sources in planning area first
  - Second trigger at 88 or 90 ppb or trend based
- VOC reductions concurrent with Phase 1 and 2 NO<sub>x</sub> reductions
- Idling reduction

# Kansas City NO<sub>x</sub> Point Sources

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- Wall Fired Utility Boilers
- Cyclone Fired Utility Boilers
- Natural Gas Fired Furnaces
- Natural Gas Compressor Station Engines
- Cement Kilns
- Cogenerating Facilities

# Proposed Kansas Phase I Controls

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- Phase I: Reduce NO<sub>x</sub> emissions from point sources > 1000 tons of actual emissions/ year in Wyandotte and Johnson Counties
  - Wall-fired EGUs in planning area
  - Furnaces
- Diesel Idle Reduction
- Diesel engine computer chip reflash

# Proposed Missouri Phase I -Controls

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- EGUs under CAIR that implement controls early
- Ethanol mandate waiver in maintenance area during the ozone season
- Diesel idle reduction

# Phase II - Missouri and Kansas

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- Selections made from a menu of control measures
  - Based on most beneficial controls according to modeling and inventory growth determinations

# Proposed Kansas Phase II Controls

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- 100 ton NO<sub>x</sub> sources
  - Cyclone EGUs in planning area
  - Furnaces
  - EGU units and RICE units outside of planning area that contribute to KC ozone problem

# Phase II - Missouri Point Source Controls

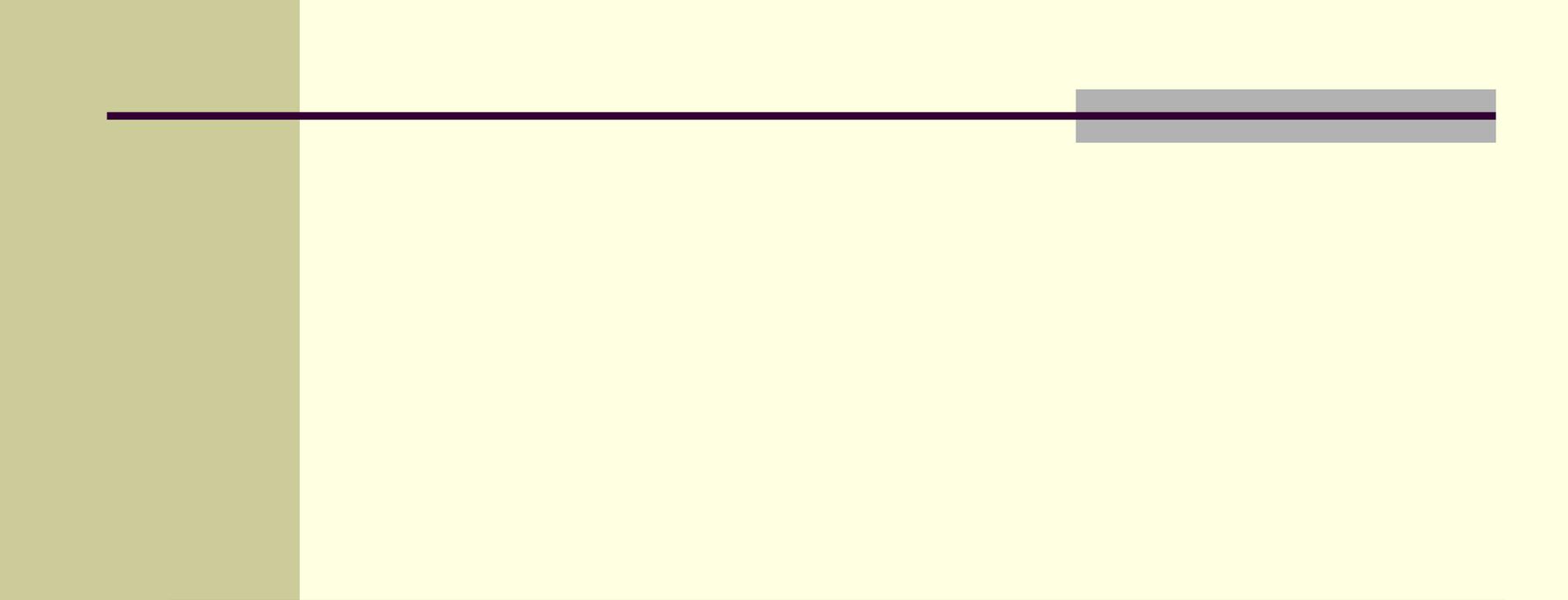
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- Reductions in NO<sub>x</sub> emissions from all point sources >100 tons of actual emissions in Clay, Platte and Jackson Counties
  - EGUs and cogenerators not included in CAIR
  - Other large NO<sub>x</sub> point sources
- Lower major source VOC threshold to 75 tpy
- Emissions offsets of 1.1:1.0

# Phase II - Missouri Area and Mobile Source Controls

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- VOC controls for Architectural and Maintenance coatings
- Gas cap testing program
- Eliminate the 1 psi waiver for 10% ethanol fuel in the maintenance area during the ozone season
- ??Voluntary diesel chip reflashing??



Comments / Questions?